ProDairy

For Professional Dairy Farmers

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Concise Guide for use of Rumen8 software and SNV Feed Library in the Tropics

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RUMEN8

Easy dairy & beef cattle diets

Rumen8 is a computer-based tool that will assist someone with nutritional knowledge to better and more cost effectively feed dairy cows. In the hands of someone without that knowledge it can create diets that appear balanced on paper but may decrease cow performance or adversely affect cow health.

Table of contents

Acknowledgements

This User Guide was written as an update of the Concise User Guide 2022.03 - (2020.09).

It has been composed for online and face-to-face training of users of Rumen8 by ProDairy E.A. Ltd in East Africa

The Rumen8 and SNV Tropical Feed Library (V6.1) can be downloaded free of charge and can be applied in large parts of the Tropics.

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1. Introduction

This Concise User Guide is meant to assist new users of the Rumen8 ration formulation software and the SNV Tropical Feed Library in Tropical regions. At the outset it is emphasised that both tools are only aids to optimise dairy cow diets. Before calculations are started, the user of the tools should make thorough observations on the dairy farm that include the cows, feed, forages in the field, water, the general farm environment, milking and handling of the animals, the level of management and farm records, including the prices paid for the feedstuffs and received for the milk.

This 'farm walk' is depicted in Figure 1. It is particularly important to get an accurate description of the quantities and qualities of feedstuffs given and the milk produced. When farmers do not keep records, obtaining this may be a challenge. It can be helpful if Rumen8 is used in a conducive environment and recognise it is only a management aid (hence the name Rumen8) and should be integrated in a broader farm coaching program.

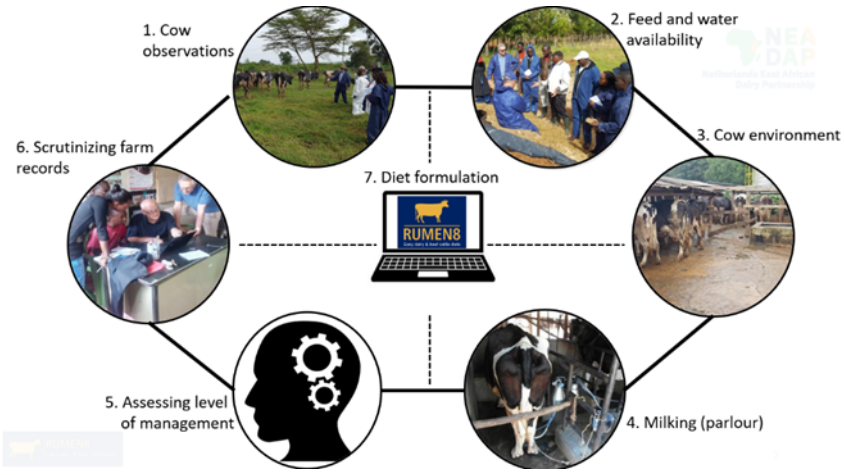


Figure 1. Cumulative steps in dairy farm coaching

For use in tropical countries, it is recommended to use Rumen8 with the SNV Tropical Feed Library that contains more than 400 tropical forages, co-products, grains, legumes, etc. Tropical forages have higher levels of neutral detergent fibre (NDF) and lower levels of crude protein. Data for the Tropical Feed Library were obtained from about 10 trusted published sources.

The library was developed for use in East Africa but has relevance for most lower latitude regions and new feeds can easily be added for individual use. The Australian feed library, which is provided with Rumen8, can be used as one of the sources for new feeds, but *as is* it is not adequate for countries with a tropical climate. An alternative resourceful website with feed tables of tropical forages is https://www.feedipedia.org/

It goes without saying that feed analyses will add a lot to the predictive power of any diet formulation tool. Instant feed analyses can be done at the farm using (handheld) NIRS, provided the predictions are based on equations that were validated with feed samples from

relevant tropical regions. However, currently this is rarely a realistic option and many Rumen8 users will still rely on on-farm feed assessment.

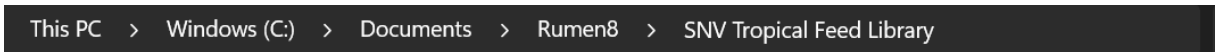
2. Downloading Rumen8 and the SNV Tropical Feed Library

Rumen8 requires the Microsoft Windows operating system to run. This can be Windows 10 or 11 and computers need a minimum screen resolution of 1024 x 768. (See https://www.rumen8.com.au/mac/index.html for how to run Rumen8 on Apple Macintosh computers).

The first step is to download the Rumen8 software and the SNV Tropical Feed Library. This can only be done from https://www.rumen8.com.au and by following the steps below. It is important to note that the Tropical Feed Library can be read and used only with the Rumen8 diet formulation software.

First install the Rumen8 software from Rumen8 Download

Once the installation is complete, in your Documents folder, go into the Rumen8 subfolder and create a new subfolder named <SNV Tropical Feed Library>.



We advise downloading the Feed Libraries using Google Chrome as your browser.

Download the latest version of the Tropical Feed Library (currently SNVFeedLibrary6.1.db3) from SNV Tropical Feed Library mirror and save it in your Downloads folder, which is usually the default location.

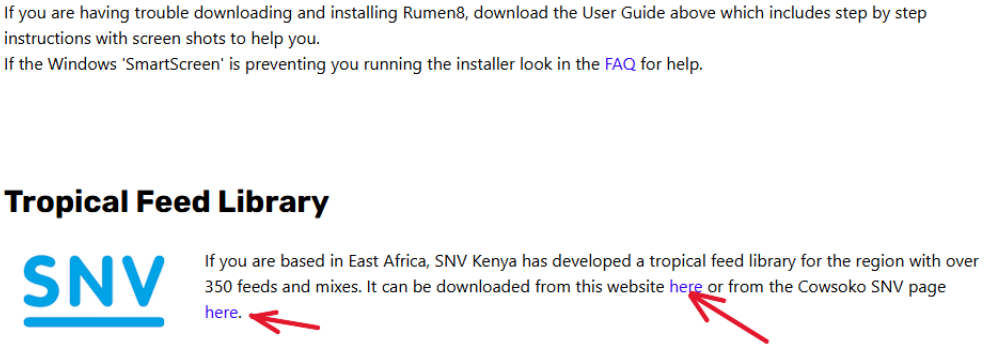


Figure 2. Screenshot of the Rumen8 website

The SNV Tropical Feed Library requires version 4.2.0.0 or higher of Rumen8. Before using the library, please ensure you are using the latest version of Rumen8 by checking for updates in the Help menu.

To import the Tropical Feed Library, start Rumen8 and it will open with the default Feed Library (usually the provided Australian Feed Library). Click 'Edit' in the left top corner menu of the Rumen8 window and then click on 'Edit feeds'. The Feed Editor window will open. Click on the tab called 'Manage libraries and Ingredient visibility'.

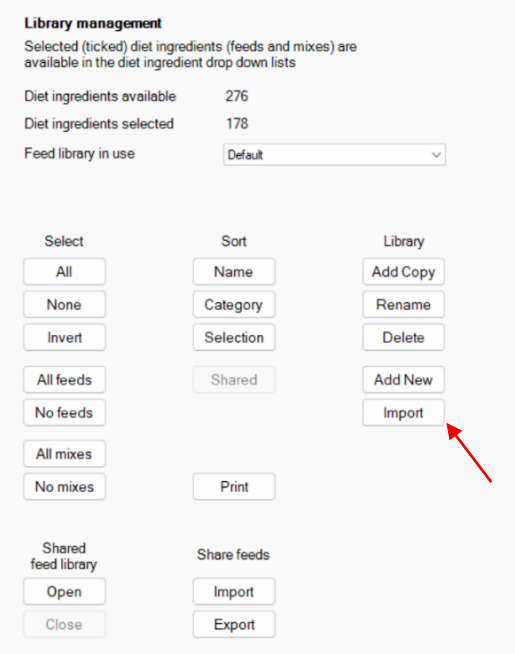


Figure 3. Screenshot of manage libraries and Ingredient visibility with the 'Default' feed library in use.

On the right side of the windows 'Library management', click the 'Import' button in the 'Library' column (Figure 3). Note, not the second import button at the bottom of the window under the 'Share' section. Move to the Downloads folder and select the file <SNVFeedLibrary.db3> you downloaded earlier. Click on it and then click on the 'Open' button. You will then be prompted to give the imported library a name so enter 'SNV Tropical Feed Library' in the entry box and click 'Okay'.

Once the library has been imported in the top right section of the Feed Editor window, under 'Diet ingredients available' you will see a figure of 415 feeds from the Tropical Feed Library (Figure 4).

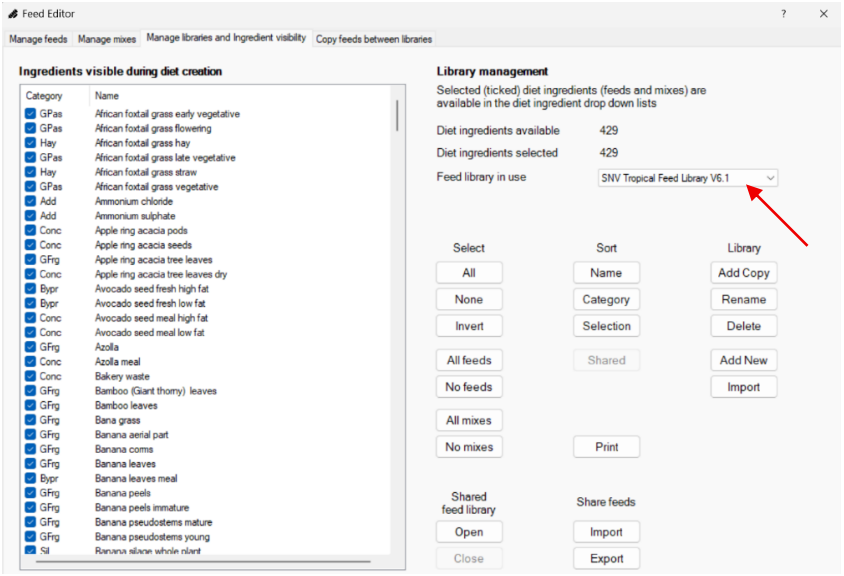


Figure 4. Screenshot of manage libraries and Ingredient visibility after selecting 'SNV Tropical Feed Library'

Your library can be edited according to your need for more feeds or the quality of feed available on the farm based on your observations or available feed analyses. We recommend you always create a copy of a feed before editing it, so the original feed definition remains unchanged. When creating a copy typically a suffix is appended to the original name that says what the feed is being used for. This might be a property name, batch number or just a date for example

3. This Concise Guide is a complement to the Rumen8 User Guide

When installing Rumen8, three supporting documents are placed in the Rumen8 group in the Start menu of your laptop. Rumen8 updates also update these documents. The Rumen8 User Guide (219 pages in the 2025.11 edition) is used most frequently and can also be accessed through the Help menu, the help option in the top right of most Rumen8 windows (not the main window) or by pressing F1. The Rumen8 Feed Companion (171 pages in the 2017.1 edition) provides a summary of typical nutritional values of approximately 160 feeds in the Australian Feed Library that the Rumen8 software package comes with.

This Concise User Guide is a quick start guide for users of Rumen8 in the tropics. It focusses on differences in use of Rumen8 in these regions such as the Tropical Feed Library and NDF to estimate dry matter intake. Where adherence to the original guide is crucial to the running of Rumen8, sometimes a sentence of the original user guide is copied in this guide. That way, this guide can also be used stand alone. For more detailed guidance, the Rumen8 User Guide should always be consulted. A series of 4 videos that discuss using Rumen8 to create beef cattle diets and 13 video tutorials that introduce Rumen8 on the Australian market and cover the commonly used functions of the software is available through https://www.rumen8.com.au/help/index.html

4. Terms and conditions

The Rumen8 software and the SNV Tropical Feed Library are provided ‘as-is’, without any express or implied warranty. In no event will the owners of Rumen8 and/or SNV Netherlands Development Organisation be held responsible and/or liable – or will accept liability - for any damages arising from the use of this software and/or the Tropical Feed Library.
While all reasonable efforts have been taken to ensure the accuracy of the Rumen8 application and the Tropical Feed Library, use of the information so provided is at the user’s own risk. To the fullest extent permitted by Australian, Dutch and international law the developers of Rumen8, ProDairy EA and SNV Netherlands Development Organisation, disclaim all liability for any losses, costs, damages and the like sustained or incurred as a result of the use of - or reliance upon - the information provided, including liability stemming from reliance upon any part which may contain inadvertent errors, whether typographical or otherwise, or omissions of any kind.

5. Registering Rumen8

When Rumen8 is run for the first time it will start in trial mode. This allows you to use all the functions of the application, but you are restricted to diets with only four ingredients. To get full access to all the diet ingredients please register, which is free. We ask you to register so the owners have an estimate of the number of people using the application. To register send an email to register@rumen8.com.au specifying the first and last names you would like to register under and the country you are based in. (For more information see page 23 of the Rumen8 User Guide 2025.11). Once you receive your registration information, open the Registration window from the Help menu in Rumen8. Copy your name and registration number and click the 'Register' button. Now your name will always appear at the top of the Rumen8 window, and you can use 15 diet ingredients in each diet in Standard Mode and 10 in Compact Mode.

6. Using Rumen8 in Compact mode

When starting to use Rumen8, it is recommended you use Compact Mode which reduces the window down to the essentials. Compact mode is recommended for learning how to use Rumen8, and for many users in the tropics, will be enough to formulate diets. Switching between modes can be done in the File menu.

Under Preferences in the File menu, also set the currency to the one you want to use. Additionally, one can set milk yield to be expressed in litres or kilograms with milk components expressed in mass/volume% or mass/mass%. The other settings under Preferences probably do not need to be changed and can be left as shown in Figure 5. In this User Guide we provide examples in KES (Kenyan Shillings). At the time of writing, in March 2026, 1 KES roughly equalled €0.0066, that is 1 € was approximately 150 KES. It is recommended to check 'Do not display cents' in order not to show cents.

To create a new diet, the cow is to be defined on the Dairy/Diet tab (Beef tab in beef mode), where the diet can be entered *as fed* or in kg dry matter (DM) (Figure 6). For determining DM intake (DMI) capacity there are three options, either the conventional method (based on NRC 2001), the so-called NDF method or ICAR (based on Indian Council of Agricultural Research). Rumen8 assumes a default value of NDF intake of 1.2% of body weight which can be altered in the Preferences (Figure 5). For dairy cows in the tropics, NDF at about 1.4% of body weight may be a better estimator of DMI than the conventional method. However, DMI is a complex matter and, where possible, intake should be weighed and assumed intake should be replaced by observed intake. (In the 'Diet detail' tab of Standard mode, the percentage of maximum DMI in the 'Conventional method' is shown next to the 'NDF method' and the 'ICAR method'. ('Conventional' should never exceed the 100% target with more than 2% to avoid feed losses).

One usually formulates for one cow that represents your herd or sub-herd. For milk yield, enter the average yield in the last 5-10 days of the herd or sub-herd. The example in Figure 6 is of a stall-fed cow and the distance walked is set at 0.5 km/d. Depending on the weight of the cow, walking on undulating terrain takes 2-3 MJ/km, which is equivalent to the energy

required to produce 0.5 L of milk. Depending on farm size, a grazing cow will typically walk 4-5 km over a day in the paddock, in addition to the distance to and from the dairy for milking.

The Cost/Price tab is where the Milk Price can be entered as well as costs or prices of the diet ingredients used. Also enter estimated costs of home-grown feeds, as otherwise Rumen8 will not calculate the diet cost. Feed losses can be altered here, which is especially relevant for silages, but can also be significant when feeding out supplements on the ground in the field.

The example in Figure 6 is one of a diet deficient in metabolisable protein (MP) as shown by the red colour of the MP bar. This can be remedied by feeding more rapeseed (Canola) meal. At the same time, supply of a low protein ingredient such as mature Napier should be reduced because the cow is already at 100 % of her physical (i.e., NDF) intake potential. Note: A green bar indicates that supply meets demand (+/- 2%, this can be adjusted in the Advanced Preferences) a red bar indicates that supply is below demand and a yellow bar supply exceeds demand.

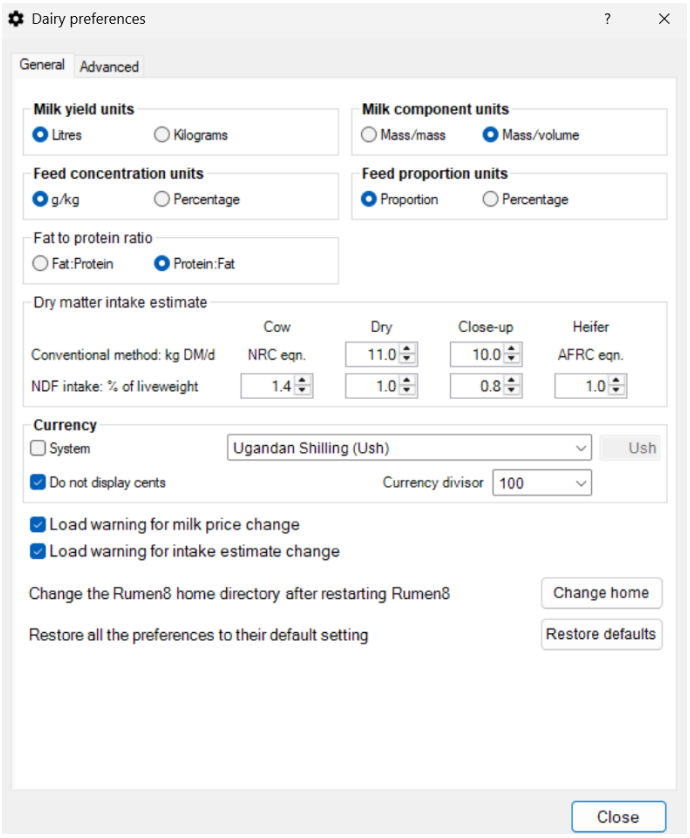


Figure 5. Example of settings under Preferences in Compact Mode

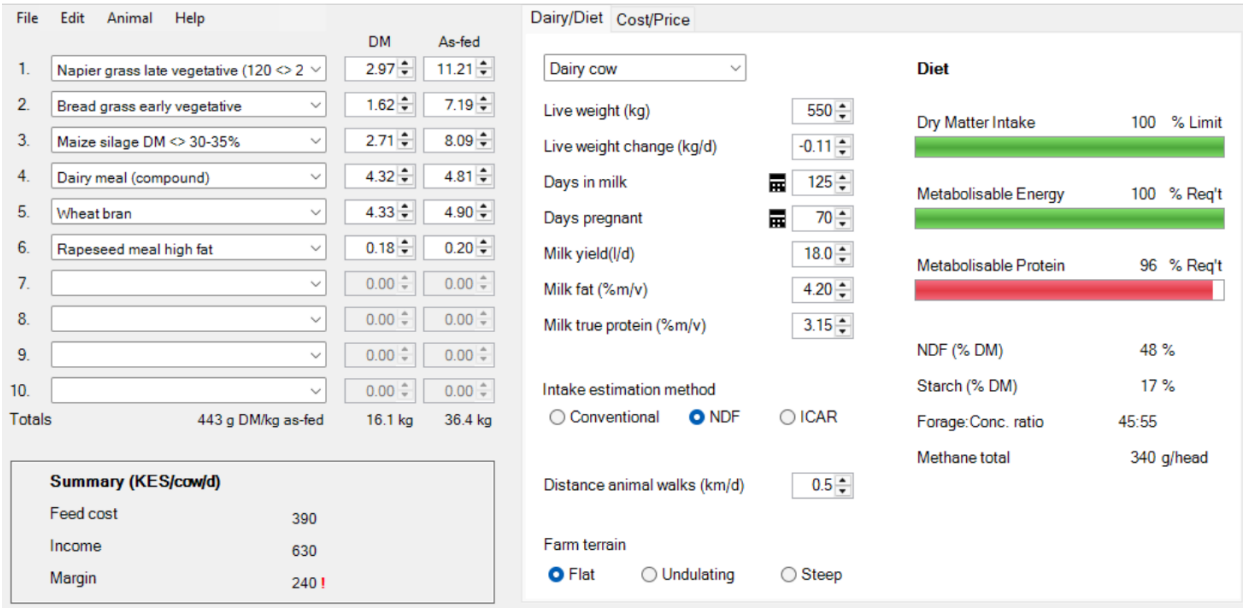


Figure 6. Example of a cow and diet in Compact mode

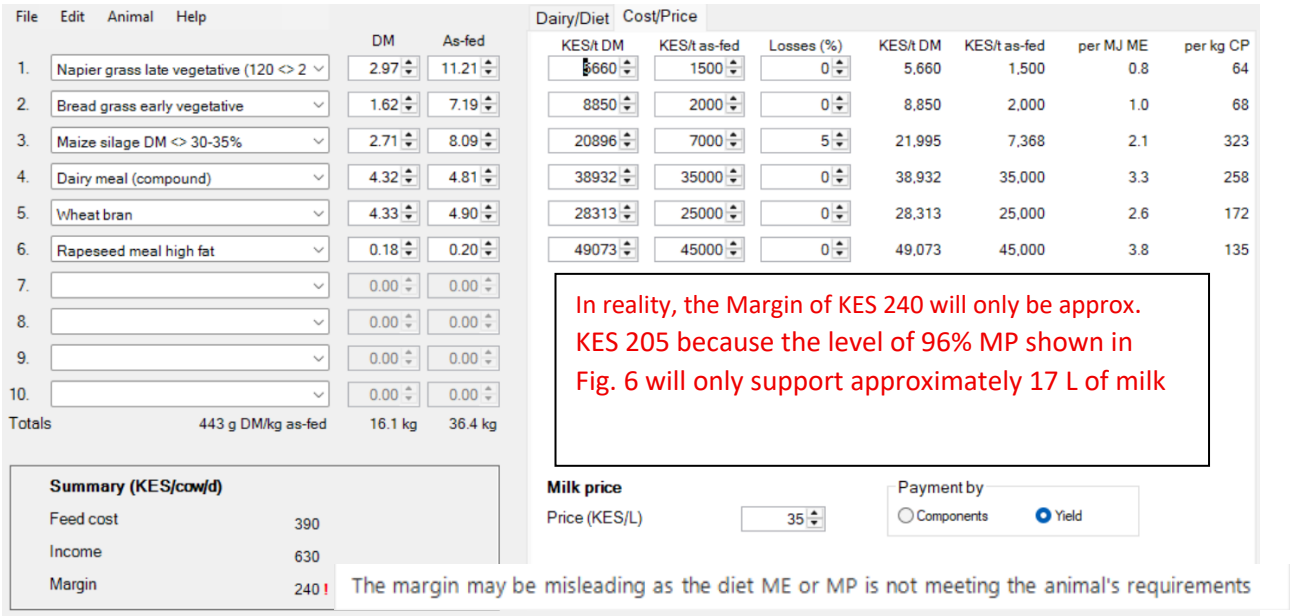


Figure 7. Example of settings of ingredient costs and milk price in Compact mode

For the farmer, the most important parameter is the Margin Above Feed Cost (MAFC), which is milk income minus feed cost. It is shown in the bottom left summary section of Figures 6 and 7. If the user hovers the cursor over the red exclamation mark a tool tip appears warning the user that "The margin may be misleading as the diet ME or MP is not meeting the animal's requirements".

6.1 Defining the animal

The approach in Compact mode should be kept as simple as possible, and the 'Animal' drop down menu on the left of the main window can be ignored till one feels comfortable with the program. Till then, the animal can be defined using your own judgement in the 'Dairy/Diet' section. A more generic approach is available through the 'Animal' menu. There, based on the

production level the diets are formulated for, one can chose a generic 'use Standard Cow' option which shows animals with 305-day lactation yields from 2,000 to 10,000 litres and allocate them to Early, Mid or Late lactation. Table 1 shows an example of a 5,000 litre cow. The Standard cow values can be edited in Standard mode via the Preferences and select Standard cows.

Table 1. Data of a Standard animal of 500 kg, producing 5,000 L in a 305-day lactation

The figures in Table 1 are the default values of an idealised cow with a calving interval of 365 days, which is not representative of many farms. You can use the standard animals to get started, but we recommend to always adjust the animal data to the actual situation on the farm. When a farmer has no data on milk composition, then milk fat % and milk protein % may be obtained from dairy companies or national statistics. Milk fat and protein strongly impact ME and MP requirements as shown in the tables that appear when putting the cursor on 'Milk fat' and 'Milk protein' on the 'Dairy/Diet' tab.

6.2 Approach for grazing animals

Formulating diets for grazing cows have the additional challenge to estimate the quantity of grazed herbage. The best approach is to enter in the diet the quantities and qualities of all ingredients except grazed pasture. Examples are concentrates, silage, hay and cut and carried fodder.

A walk through the pastures is required when estimating the quality of the herbage eaten, taking account of the quantity of feed on offer, and associated effect of selective grazing. We advise approaching the grassland quality with an average value of all the grasses and legumes in the pasture. Then enter in Rumen8 the feed from your library that best describes what is grazed, e.g., African foxtail grass, Couch grass, Kikuyu grass, Maasai love grass, Rhodes grass, Setaria grass, Star grass, Themeda grass, or the generic Natural grassland. Next, based on feed analyses (rarely available), or your judgement, edit the Table values of the grass that you

entered, after first having made a copy of the feed and renamed it as ‘Pasture, Farm name, Date’.
Subsequently, increase the quantity of grass in the diet to the level where ME supply matches ME requirements for the level of animal production set in the Dairy/Diet tab. This should not exceed 100% of the ‘Conventional’ feed intake limit. This ‘back calculating’ gives the best estimate of herbage intake. Now you can set out balancing the diet as described in this guide.

7. Using Rumen8 in Standard mode

Figure 8 shows the same cow in Standard mode. This mode shows many more variables, but it requires more experience and expertise to use and interpret it. If you are unsure what the different terms in Rumen8 stand for, hover your mouse over the item and for most items a tool tip will appear providing a more detailed explanation. In Standard mode, the joint tabs for ‘Dairy/Diet’ and ‘Cost/Price’ are given separately and in more detail. New tabs include ‘Diet detail’ and ‘Compare’. Under the ‘Dairy’ tab, the inputs Live weight change, Days pregnant and Days in milk have calculators or calendars next to them to facilitate entering the right data. The calendars to estimate days in milk and days pregnant are self-explanatory.

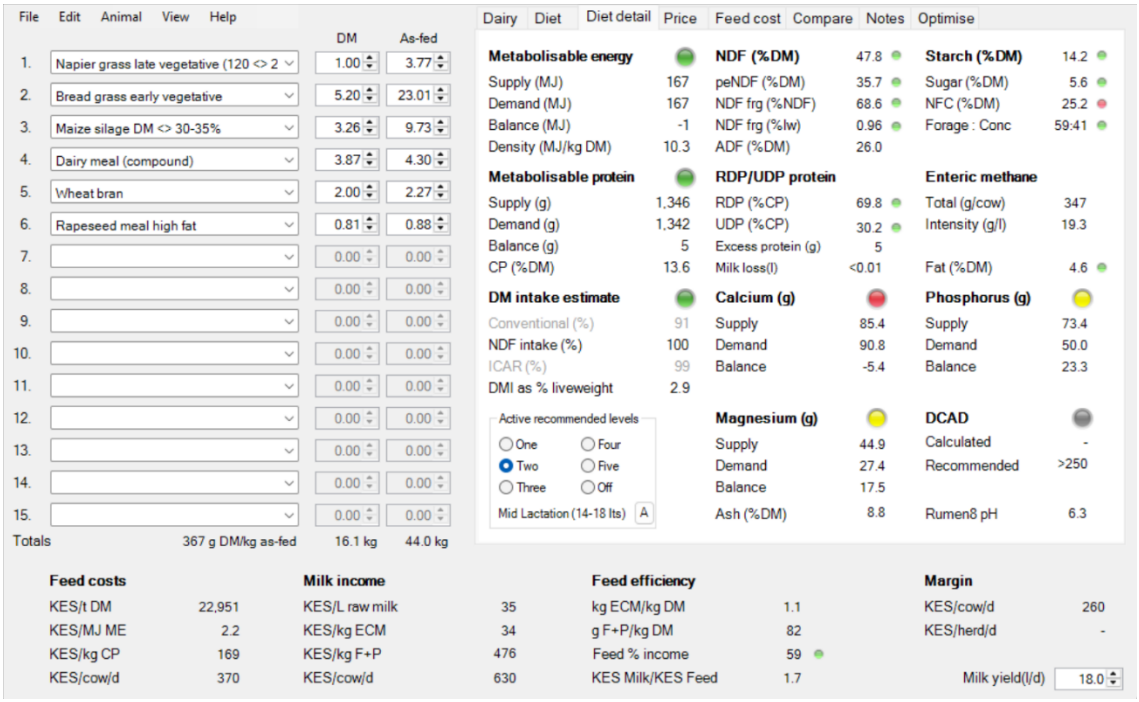
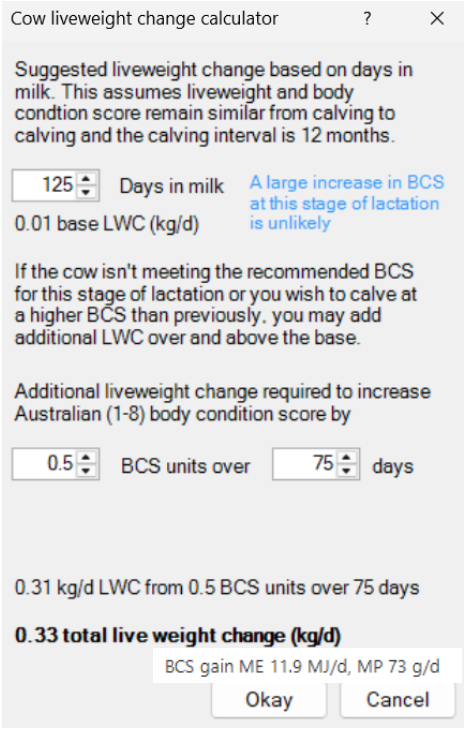


Figure 8. Screenshot of the cow of Figure 6 and Figure 7 in Standard mode; now on a balanced diet

7.1 Live weight change calculator



The Live weight change calculator is a useful tool as shown in the following example. First hover over the caption 'Live weight change (kg/d)', and a Figure and Table with target Body Condition Scores (BCS) will appear. Note that those will only appear if a cow and diet are entered. Figure 9 on the left is a screenshot of the cow shown in Figure 6, i.e., weighing 550 kg, 125 days in milk and losing 0.11 kg per day.

The Table (not shown here) that appears when hovering over 'Live weight change (kg/d)' shows a target Penn State BCS in mid lactation (d 101-200) of 3.0. If 'our cow' has a BCS of 2.5 then you may want to give the cow more feed to allow the BCS to rise by 0.5 units to 3.0. Then open the calculator adjust BCS with the upper arrow to 0.5 units and adjust days to, 75 days. (75 days was chosen to achieve the gain in BCS by 200 days in milk, which is the end of mid-lactation).

Figure 9. Example of cow liveweight change calculator

The calculator shows that 0.31 kg/d live weight gain is needed to reach 0.5 units BCS at the end of the 75-day period. Putting the cursor on the 0.31 kg/d shows that each day an additional 11.9 MJ ME and 73 g MP are needed. That is roughly the equivalent of 2 L milk/d production! Click on <Okay> in the calculator and the base live weight change of 0.01 kg/d increases by 0.31 kg/d to (rounded) plus 0.33 kg/d.

7.2 Diet detail and recommended levels

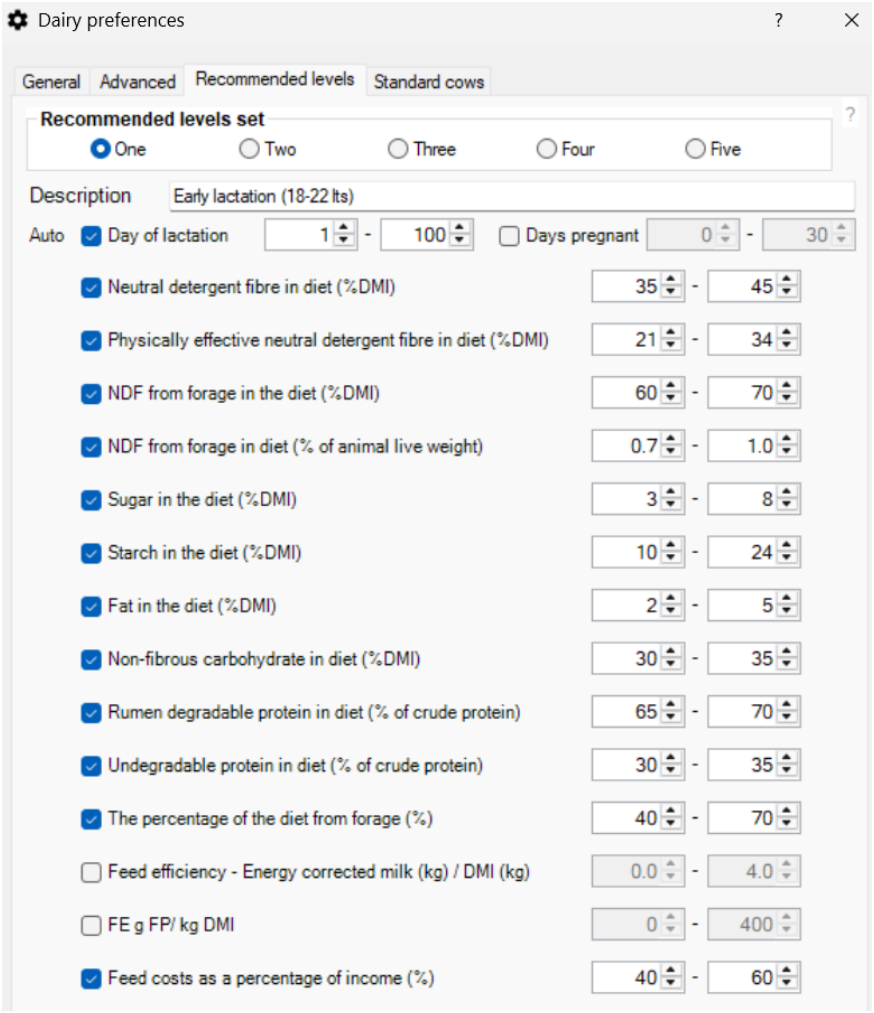


Table 2. Recommended levels set 1 under dairy preferences in different production phases of dairy cattle diets in the Tropics

The 'Diet detail' tab is a very valuable one in that it allows evaluation of a diet against Recommended levels of nutrients and other targets. This is indicated by the colour of the 'traffic lights' with green indicating that demand and supply match while a shortfall is indicated by a red traffic light and an oversupply is indicated by a yellow traffic light. The recommended levels can be set by the experienced user under <File> <Preferences> <Recommended levels>. It has five level sets available. We recommend using the five physiological sets and settings as shown in Table 3. Those differ from the simplified example of Early Lactation (up to day 60 against day 100 in Table 1) shown on page 91 of the Rumen8 User Guide version 2025.11. The transition or close-up period is the last 4 weeks before calving and is linked to days pregnant. Rumen8 assumes a gestation length of 285 days.

These recommended nutrient levels are indicative only. They are based on theoretical considerations for cows of 500- 550 kg and producing 4,000- 5,000 L in a 305-day lactation period. The targets are to be treated with caution and use is at one's own risk. Adjust the figures based on nutritional principles, level of production, feed quality (e.g., starch level and

quality), feeding system (± TMR), manure consistency, level of management and other parameters you took note of during the farm walk.

When 'Recommended Levels' are set, several smaller traffic lights will appear on the Diet and Diet detail tabs and these too show whether the current values are under (red), within (green) or above (yellow) the recommended ranges. Independent of the 'Recommended Levels', a warning may appear next to some parameters (e.g., starch) if the dietary level suggests the cow may be in danger of ruminal acidosis (Figure 10). For further information about each parameter displayed on the 'Diet detail' tab, hover your mouse over any heading and a tool tip will appear with an explanation. When hovering the mouse over any of the 6 progress bars on the 'Diet' tab, the actual values appear.

Variable	Early lactation	Mid lactation	Late lactation	Dry	Transition
Levels set	Nº 1	Nº 2	Nº 3	Nº 4	Nº 5
Days in Milk	1-100	101-200	201-end lact.	dry	> 257 d.i.c
NDF % in DM	35-45	40-50	45-50	50-60	45-55
peNDF % of NDF	60-75	65-80	70-80	70-80	70-80
NDF frg % of NDF	60-70	65-70	70-75	90-100	85-90
NDF frg % of LW	0.7-1.0	0.6-1.0	0.6-1.0	0.5-1.0	0.5-1.0
Sugar % in DM	3-8	2-8	2-6	2-4	2-5
Starch % in DM	10-24	1-22	10-20	10-15	10-20
Fat % in DM	2-5	2-5	1-5	1-5	2-5
RDP %	65-70	68-72	70-74	75-80	75-80
UDP %	30-35	28-32	26-30	20-25	20-25
Forage % in F:C	40-70	45-70	50-80	80-100	75-85
Feed % income	40-60	50-60	50-60	-	-
ME per kg DM	10-12	10-11	10-11	9-10	10-11
CP % (as proxy for MP)	15-19	14-17	42339	≈ 12	≈ 14
Body wt change, kg/d	-0.5	0	+0.3	-	-

Table 3. Target levels in different production phases of dairy cattle diets in the Tropics

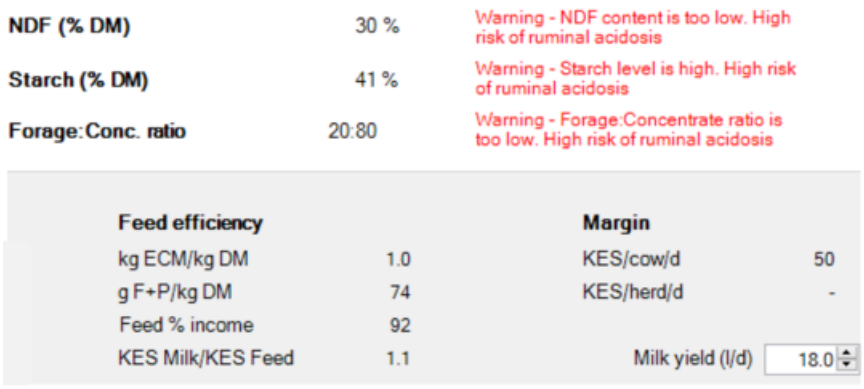


Figure 10. Examples of warnings on the Diet tab about the risk of ruminal acidosis

7.3 Price

In Standard mode 12 milk prices can be defined in the (Milk) Price tab, either by volume or component value. Multiple Price libraries can be used for different farms or countries.

7.4 Feed cost

Feed costs as well as feed losses can be viewed and altered on this tab. Please note that a Margin (MAFC) can only be calculated when all diet ingredients have a cost. Costs can be entered or altered on the Feed cost page and in all Feed libraries. When changing a cost or losses (%) on the Feed cost page, the cost or losses will also change in the feed library in use. This is the feed library you have selected in the Feed Editor or via the Edit menu.

Costs and losses of the Diet ingredients used can also be viewed under 'Diet ingredients' on the left half of the main window. There, all diet ingredient details can be accessed in four ways. Hovering the cursor on any of the 15 Diet ingredient names opens a tool tip window in portrait orientation with all details of that ingredient. Alternatively, right-click on the number in front of the Diet ingredient and a larger screen with all details will open in landscape orientation. The landscape orientation screen can also be opened by using the menu <View> <Ingredient detail> <Feed ingredient number>.

7.5 View menu

On the left side of the ribbon, Standard mode has a 'View' menu that provides interesting details on all diet ingredients as well as on the ME, MP and minerals calculations. For quick access from the main Rumen8 window to the ME, MP and Mineral calculations, just click <Ctrl> <E>, <Ctrl> <T> or <Ctrl> <M> on the keyboard or, on the 'Diet' and 'Diet detail' tab, left click on the headings 'Metabolisable energy', 'Metabolisable protein', 'Calcium', 'Phosphorus' or 'Magnesium'. This section is particularly informative for students, especially when read together with the figures and text included in the tool tips on the 'Diet detail' tab. On that page, just hover over the captions 'Metabolisable energy', 'Metabolisable protein', 'Calcium', 'Phosphorus' and 'Magnesium'.

7.6 Compare tab

The Compare tab is a very useful feature. Here, 6 diets can be stored along with important parameters, including the DM quantities of diet ingredients, percentage of optimal DMI (in the NDF method *and* NRC method), supply and demand of ME and MP and MAFC. This is a handy page to discuss with the farmer and to choose the best diet from (Figure 12). With the S(tore) button, the diet is saved in slot 1 to 6. They can be subsequently (R)estored or (C)leared. Optionally, a tab 'Split herd' is shown to the right of the Compare tab. This facility is rarely used in the tropics, and we recommend to un-tick it under <File>, <Preferences>, <General> so it is no longer visible.

8. Using Rumen8 in Optimise (advanced) mode

The Optimise function in Rumen8 is only recommended for those with a thorough knowledge of dairy cow nutrition and of computers. If you possess both, then diet optimisation can assist you to formulate the lowest cost diet from up to 15 ingredients in a time efficient manner. Optimise requires Microsoft Excel to be installed along with its Solver add-in. To install Solver,

follow all steps on pages 147-151 of the Rumen8 User Guide 2025.11. Now when you return to the main Rumen8 window in Standard mode, a new tab called 'Optimise' will be available.

The fewer constraints that are ticked in Optimise, the cheaper the diet, and the higher the MAFC. In a first approach you may only want to tick 'ME demand', 'Intake (kg NDF)' and 'MP min. demand' and click 'Optimise' to run the program. You will most likely get the message: 'All constraints satisfied. Feasible diet found'. Thereafter open the 'Diet detail' tab and use your nutritional knowledge to see if and where things go wrong. For instance, you may see that the diet with the highest MAFC has unacceptably low NDF and forage contents, and/or too high a starch content. If that is the case warnings appear in the bottom right-hand corner of the Diet tab about a high risk of ruminal acidosis as shown in Figure 10.

The next step is to set the next constraint, e.g., the range of Forage : Concentrate Ratio and run Optimise again. When formulating a diet for grazing cattle, first estimate pasture intake as described under section 6.2 and set this quantity as a fixed amount as one of the bottom four ingredient constraints. Set constraints step by step because setting unnecessary constraints will make the diet unnecessarily expensive. You may also get the warning: 'Unable to formulate a diet within the specified constraints'. In that case you must lower the number of constraints or change the minimum or maximum values of the range within which a parameter must fall. Only do this when nutritionally justified. The constraint ranges on the Optimise tab can be quickly set to the recommended levels (set in 'Preferences') by clicking on the 'RL' button which opens the 'Apply recommended levels to the optimiser' window.

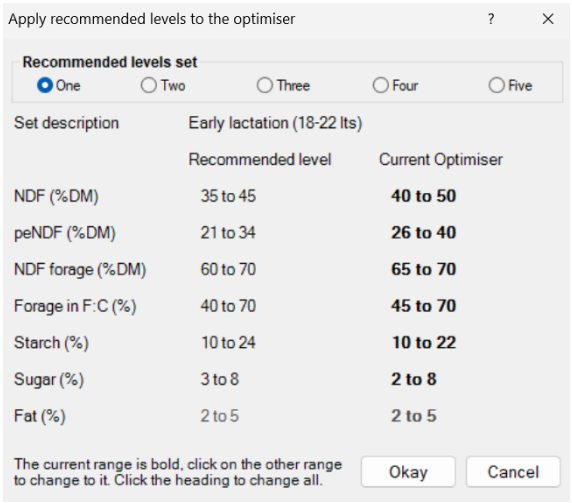


Figure 11. Example of recommended levels for use with optimiser

Make sure the correct recommended levels set is checked with the optimiser. Up to 5 sets of recommended levels for a range of diet parameters can be set in the 'Preferences' menu providing quick feedback on the suitability of a diet on the Diet tabs. Depending on your experience, allow some deviations from the recommended levels because animal nutrition is not an exact science and sometimes relaxing the range by only a few percentage points can create a much cheaper diet. When satisfied with the nutritional and financial optimum diet, store it under the Compare tab and save the file.

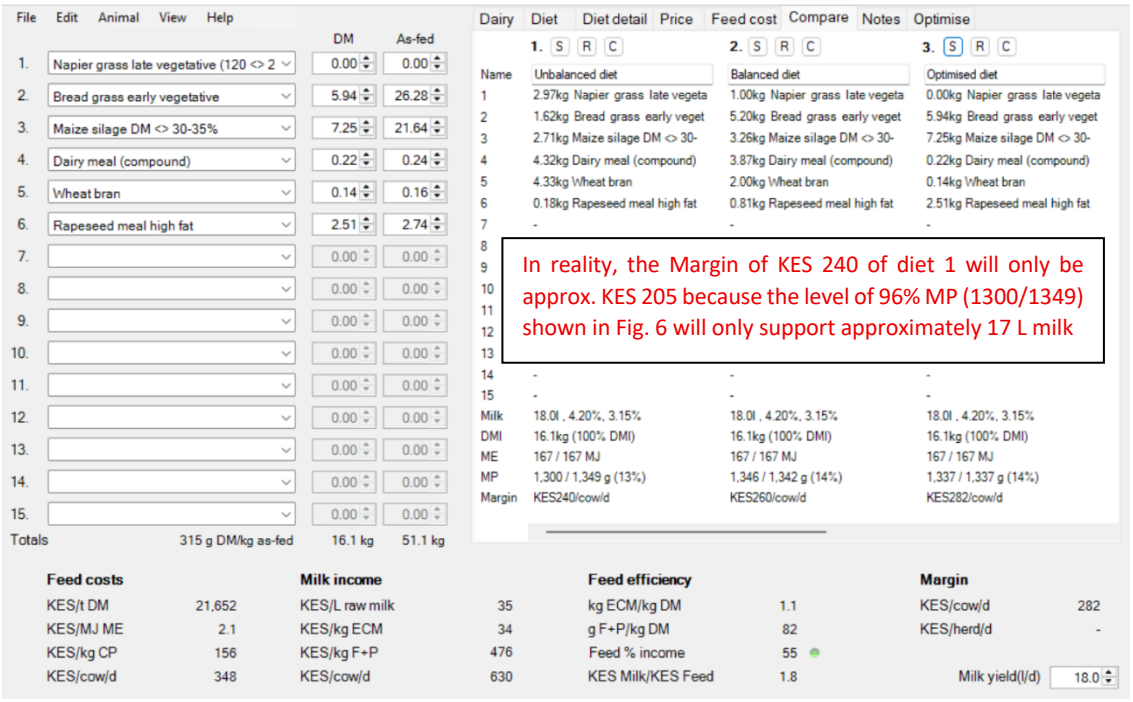


Figure 12. Compare tab; diet 1 is unbalanced, diet 2 balanced manually and diet 3 using Optimise

In the Compare section of Figure 12, diet 1 is the original diet shown in Figure 6 (Compact mode) that the farmer told us was being fed and achieving a milk production of 18 L. However, if the diet fed is indeed the quantity and quality entered, then only 96% (1300/1349) of the MP demand was supplied, and milk yield is likely to drop to approximately 17.0 L. Diet 2 is well balanced and supports a milk yield of 18 L. Balancing was done as well as possible in Standard mode (Figure 8) and could also have been done in Compact mode. Diet 3 shows that MAFC can be increased by KES 22 (KES 282 minus KES 260) by using the Optimiser. With an identical ME and MP supply as Diet 2, Diet 3 was KES 22 per day cheaper, showing the strength of the Optimise facility. This does, of course, not hold if the diet ingredients are not weighed well or of a composition different from the ones in the feed library used.

9. Other features of Rumen8

This Concise User Guide cannot cover all the features of Rumen8. Some other possibilities worth using include making a farm feed library, editing feeds, making a feed mixture and creating a report, estimating emission of enteric methane, and diets for mated and unmated heifers.

9.1 Farm Feed Library and editing feeds

When advising at several farms, it is recommended to create user feed libraries for each farm, especially if there are differences in feeds, feed qualities and feed costs. Separate feed and price libraries are recommended when advising in different countries using local currencies.

A copy of the current feed or price library can be created and then modified to suit the farm or country in a similar way.

> **Tip for users**: Always use a new name for each farm visit e.g. 2026-03-25 John Doe Farm. This also applies to the Feed and Price library which you create for the farm. In this way feed and milk prices, diet ingredients and mixes remain farm specific and will appear at the top of the Feed Library in use if the feed ingredient starts with the date. Once the feed batch is used the specific diet ingredient can be removed.

Nutritive values can be edited in all feed libraries but it is highly recommended to make a copy of the feed you want to edit and save it under a new name. Thereafter, edit the values of the new feed that you have reasons to change. Reasons for changing values include a feed analysis or a visual assessment. If the feed analysis has data for DM, ME, CP, NDF and starch, then only edit those values in the new feed.

We recommend leaving all other values as copied. In the above example that includes fat, ash, peNDF, sugar, minerals, aN, bN and cN. Rumen8 will not calculate a diet if you leave blank, one of the required feed parameters (bold names in the feed editor). Moreover, it will be difficult for most users to find reliable data on aN (proportion of water-soluble N, which is the immediately available portion of feed CP), bN (proportion of potentially degradable N, other than water soluble N) and cN (fractional rumen degradation rate/h of the b fraction). Outside the Rumen8 libraries, the nutritional tables in Feedipedia are one of the few places where aN, bN and cN values can be found, click the following link:
(https://www.feedipedia.org/content/feeds).

Also note that the absorption coefficients for calcium, phosphorus and magnesium in the various libraries used in Rumen8 always are 0.30, 0.64 and 0.16 respectively for roughages and 0.60, 0.70 and 0.16 for concentrates.

Even when entering a totally new feed in your library it is advisable to start with a copy of a similar feed of a similar category in the SNV Tropical feed library (SNVFeedLibrary6.1.db3) or the Australian Rumen8 feed library. By creating a new feed from an existing one you will automatically label them with the right 'Feed management category', Feed protein type' and 'Feed particle size classification'.

9.2 Making a feed mixture

Feed mixtures can be made in the Feed Library or created automatically from the current diet. To create mixes from feeds in the library, in the main window click <Edit> <Edit feeds> <Create mixes>. Click <Add New> if this is a new mixture.

Multiple feeds can be added to the mix by selecting the first feed from the list of feeds, holding down the control key on the keyboard and then selecting the remaining feeds one at a time keeping the control key pressed. Then click on the arrow (<) button to move the selected feeds into the mix. Now enter the percentages of each feed, either on a 'Dry matter' or on an 'As fed' basis.

The feed percentages must equal 100% before you will be able to exit the mix editor and save the mix with a unique name. Before clicking 'Okay' enter a cost of the mix, which usually is the sum of the 'Ingredients cost' shown plus a fee for mixing. Now the mix can be used in the diet. By hovering the cursor on the name of the feed, all parameters are shown in the tool tip.

Mixtures can also be created automatically from the current diet by selecting <Edit> from the main menus and then <Create Mix from the Diet>. Then unselect feeds that you don't want included in the (compound) feed mix and provide the remaining information required to complete this action. Mix percentages can be shown on an *as is* or on a dry matter basis. This facility is also handy for TMR (Total Mixed Rations).

9.3 Making a report

To create Rumen8 reports you must also install the SAP Crystal Reports Runtime Engine on your computer. The installer for this software is available from the Downloads page of the Rumen8 website and there is more explanation on page 12 of the Rumen8 User Guide 2025.11. If you are unsure whether your version of Windows is 32 or 64-Bit start Rumen8, load a few ingredients and then open the Report Designer from the File menu.

Click on the 'Create' button and a warning will appear telling you the SAP runtime has not been installed. It will show you whether your version of Windows is 32 or 64-bit. Click on the links provided to download the correct runtime and then install it. Now the Report Preview window should appear when you create a report.

The following report types can be generated: 'Diet Report', 'Daily Feeding Sheet', 'Batching Sheet', 'Diet Comparison Report' and 'Diet Comparison report (as fed)'. In addition, a Feed Composition Report can be generated by selecting <Edit> <Edits Feeds> (or Ctrl F) from the menu bar and then selecting the <Print> option. One can then select the feeds and/or mixes to be included in the feed composition report and select <Create> which will generate the report which can then be saved as a PDF or in alternative file formats.

9.4 Estimating emission of enteric methane

Rumen8 provides a prediction of enteric methane produced by the cow (equation 10 by Niu et al., 2018): The equation is shown in the tooltip associated with the caption 'Enteric methane' on the 'Diet detail' tab. Methane is expressed both as total methane in grams per day and as the amount (in g) of methane produced per L or kg of milk. A higher milk yield dilutes the feed that is used for maintenance, and it follows that increasing milk yield is one of the most effective ways of lowering methane intensity.

9.5 Diets for mated and unmated heifers

Rumen 8 also has a handy calculator for heifers to estimate the required rate of gain to meet target live weight at mating or calving (55% and 85% herd mature weight respectively by

default). An example is given in Figure 13. Once the target average daily gain has been calculated, click <Okay> and the required live weight change (i.e., daily gain) and days pregnant will appear on the Dairy page. Now diet formulation can be done, just as with dairy cows.

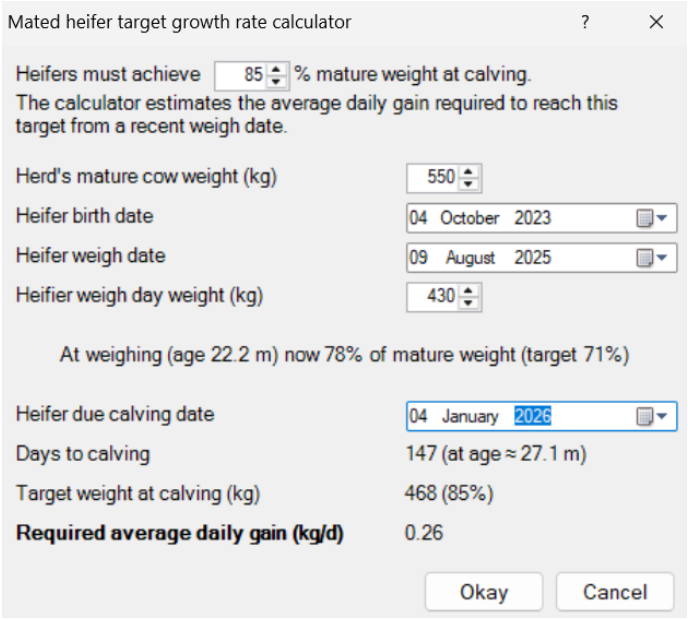


Figure 13. Mated heifer target growth rate calculator

Concluding remarks

This Concise User Guide will get users in the tropics started quickly with the main functions of Rumen8 and supports remote coaching. However, going through a classroom course and field practicing the use of Rumen8 is strongly recommended to make more confident and efficient use of the tool. Building up skills in dairy cow nutrition and in Rumen8 is further enhanced by referring to the comprehensive 219-page Rumen8 User Guide 2025.11. The latest edition of the document can be accessed through the Start menu of your laptop. Keep in mind that those manuals were written for Australian farming conditions and the examples show more stringent recommended levels of nutrients than what is feasible or recommended in the tropics. In all instances, use common sense. After all, a software package only is an aid ('Rumen8') in decision making. The cow has the final say.

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Supporting our industries to build a better future

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For Professional Cattle Farmers

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PUM.
Together we grow

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Capacity+ Ag Consulting
Helping build effectiveness, productivity and profit

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RUMEN8
Easy dairy & beef cattle diets